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A Bibliometric Analysis of Management Policies to Support Renewable Energy Implementation in Oil and Gas Company Using VOSviewer

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ABSTRACT

This study aims to analyze oil and gas management policies to support the implementation of renewable energy use by using VOS viewer, a bibliometric analysis tool, to examine the oil and gas management policy research landscape. The dataset consisted of 1308 articles which were collected from the Scopus database, accessed on June, 15th 2023, using keywords related to oil and gas, policy, and renewable energy, and also restricted to specific disciplines, including energy, environmental science, engineering, business, management, and accounting. The results of this study firmly show how important a role of renewable energy initiatives serve in the oil and gas industry. The implementation of renewable energy initiatives in the oil and gas industry not only contributes to enhanced operational efficiency and cost reduction but also promotes environmental sustainability. It was further identified that management policies play an essential role in facilitating the successful integration of renewable energy. These policies should emphasize renewable energy integration, the establishment of regulatory frameworks, the provision of incentives and subsidies, the promotion of collaboration, and alignment with institutional factors. A successful shift to renewable energy also requires change management strategies that include components like a clear vision, leadership commitment, goal setting, resource allocation, employee involvement, stakeholder engagement, and continuing evaluation.

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Introduction

Oil and gas (O&G) is a highly crucial industry in the energy market, which plays a dominant role in the global economy. This sector has significantly aided in the growth and advancement of societies all over the world because it is a substantial source of fuel. The oil and gas industry provides the energy required by a number of industries, particularly transportation, manufacturing, and power generation (Al-Shubiri, 2015). Despite the vital importance of oil and gas as a key energy source for global development, its use has significant implications for many of the challenges faced by society today. One of the most pressing issues is its impact on climate change. Carbon dioxide and other greenhouse gases are released into the atmosphere when fossil fuels like oil and gas are burned, which contributes to global warming and climate instability (Vakulchuk et al., 2020). Therefore, the use of oil and gas energy requires the development and implementation of effective policy management (Mewenemesse & Yan, 2022).

For the global oil and gas business, effective managemen policies are essential, but there are a number of difficulties involved. The oil and gas sector has to deal with the problem of interacting, evolving, and adapting to the shifting policy and investment environment in a way that supports, contributes to, and maybe even leads efforts to decarbonize the energy system. (Johnston et al., 2020). Inadequate or inefficient policies can have significant consequences, including environmental degradation, economic instability, and social impacts (Guercini & Tunisini, 2017). The complexity of the oil and gas business must be taken into account when creating and implementing policies that encourage the use of sustainable energy sources.

Due to declining state revenues, Indonesia's oil and gas industry changed from the cost recovery PSC (Production Sharing Contract) plan to the gross split PSC scheme. Through the help of the cost recovery PSC, contractors may efficiently recover their exploration and production costs from oil and gas earnings before giving the government a cut of the remaining profits. A gross split PSC eliminates the contractor's ability to exclude exploration and production expenses from oil and gas earnings before allocating the profits to the government. In circumstances where exploratory efforts are unsuccessful or when production costs rise, this exposes them to larger financial risks. As the financial risks connected with these activities increase, the absence of cost recovery provisions might discourage potential investors from starting new exploration projects or making investments in operational oil fields. The Indonesian government needs to make aggressive efforts in terms of strict and definite regulations to address these problems. The implementation of the gross split can be more clearly understood and subjected to less legal uncertainty when tax regulations are given special attention (Yuniza et al., 2020).

To foster the adaptability of companies in the oil and gas industry, change management is an important aspect of new technologies, processes and regulations or policies (Laskar, 2022). The oil and gas industry faces significant change management challenges as it transitions to renewable energy sources. In some developed countries, the development of renewable energy has been carried out at affordable prices (Abu-Rumman et al., 2020). In contrast, developing countries are struggling with attracting adequate and cost-effective investments in the implementation of renewable energy (Rezaei et al., 2021) In furtherance of this inadequate fiscal incentives, lack of confidence in renewable energy technologies are barriers to the implementation of renewable

energy projects (Seetharaman et al., 2019). More alternatives are being considered in the next years to fully eliminate the function of the O&G business, but the current technologies are not yet commercially mature to allow it (Tamala et al., 2022).

While several studies explore different aspects of management policies in the oil and gas industry, there is an absence of comprehensive studies that employ bibliometric techniques to analyze research trends, influential authors, collaboration networks, and emerging topics. Bibliometric analysis can help identify research gaps in a particular field, such as areas where little research is needed (Suzan & Suzan, 2021). In this study, we used VOSviewer (https://www.vosviewer.com/) in analyzing the bibliometrics of oil and gas management policy research trend to support the implementation of renewable energy use. The analysis will explore search categories of research and knowledge in this area, identify the most frequently occurring terms relevant to this field of study, and generate clusters of related publications. This information can support the implementation of renewable energy use in oil and gas sector industries by identifying gaps in the current research and informing the future research directions

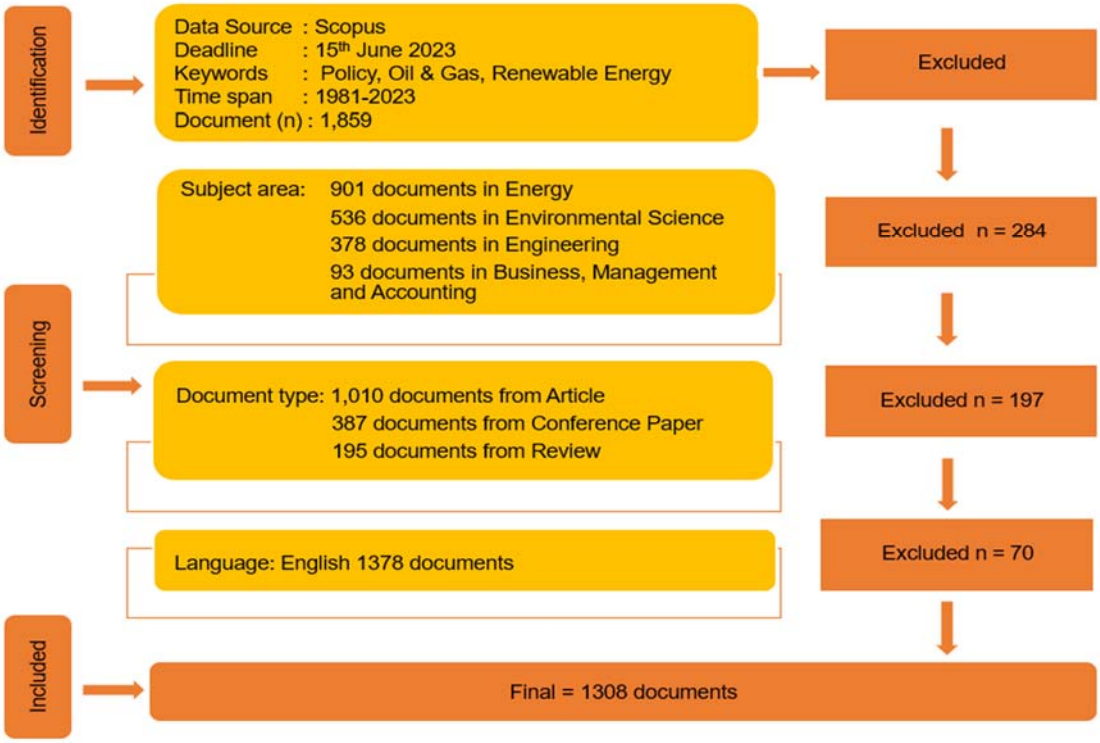
Methodology

This study employed VOSviewer (https://www.vosviewer.com/) as the main analysis and visualization tool to undertake the bibliometric analysis. VOSviewer is a widely known and powerful software tool that is specifically designed to visualize and analyze bibliometric networks (Kuzior & Sira, 2022). By using VOSviewer, this study was able to gain valuable insights into relationships, patterns and trends in the dataset. The dataset was collected from the Scopus database (https://www.scopus.com/) which accessed on June, 15th 2023, using keywords related to oil and gas, policy and renewable energy, as well as specific disciplines namely Energy, Environmental Science, Engineering, Business, Management, and Accounting.

The research focused on the keywords policy, oil & gas, and renewable energy, therefore the search term in the Scopus is “POLICY” AND “OIL & GAS” AND “RENEWABLE ENERGY”. In addition, the research subject is limited in the fields of Energy, Environmental Science, Engineering, Business, Management, and Accounting. This is due to those research disciplines are directly relevant to the research topic. The selected data for this research are only for English-language based articles and comes from articles, conference papers, and reviews which were published until June 15, 2023, to include the latest research developments.

Figure 1 provides a visual representation of the process which was involved in collecting the data for this research. This includes three stages, starting from the identification and screening of data, and finally ending with the inclusion of relevant articles. Through the predefined boundaries, a total of 1308 articles were collected for this research. The articles were exported in CSV format in order to get the necessary data, which made it possible to extract crucial bibliographic information such author name, affiliation, publication year, citation, and keywords. After gathering the data, it was imported into VOSviewer, an application used for analysis and visualization, allowing further investigation and analysis.

Figure 1.
The stage of data collection process


Identification
Data Source : Scopus
Deadline : 15th June 2023
Keywords : Policy, Oil & Gas, Renewable Energy
Time span : 1981-2023
Document (n) : 1,859
Excluded
Subject area: 901 documents in Energy
536 documents in Environmental Science
378 documents in Engineering
93 documents in Business, Management and Accounting
Excluded n = 284
Screening
Document type: 1,010 documents from Article
387 documents from Conference Paper
195 documents from Review
Excluded n = 197
Language: English 1378 documents
Excluded n = 70
Included
Final = 1308 documents

Results & discussion

The findings present the significance of renewable energy and its integration into oil and gas companies' operations. The implications and importance of these findings will be further addressed in the discussion section.

Results

The data presented in Figure 2 represents the growth of annual document publications from 2002 to 2022. The data shows a fluctuating pattern from year to year, with the number of documents published varying each year. The highest number of publications occurred in 2021, with 131 documents, followed by 2022 with 118 documents. In particular, there was a consistent increase in the number of publications from 2002 to 2019, peaking in 2019 with 96 documents. Nevertheless, the following years experienced some fluctuations, with occasional increases and decreases.

Figure 2.
The annual publication growth of documents from 2002-2022

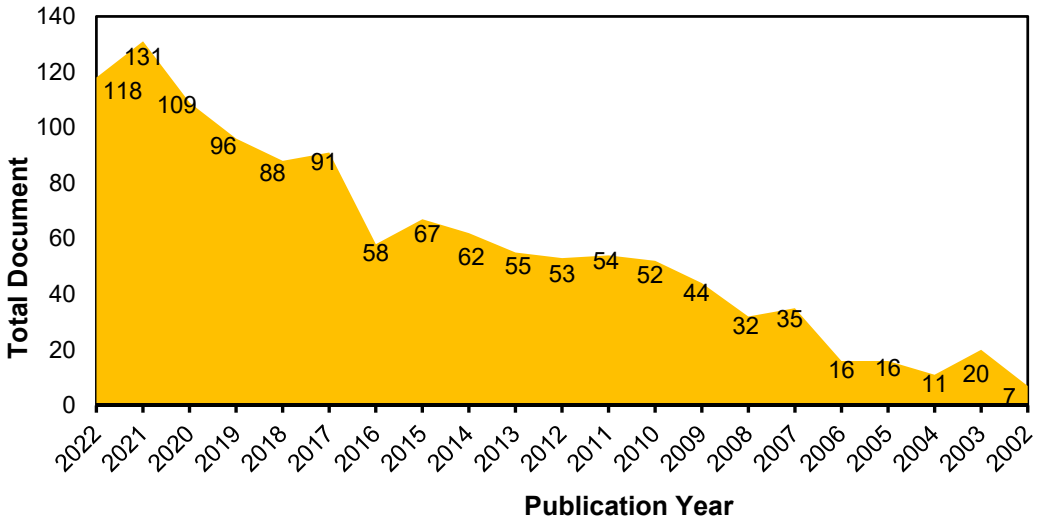


Figure 3 provides information on the most cited source documents. The top of the list is "Energy Policy" with 97 citations, indicating its prominence in energy-related discussions and policies. "Renewable and Sustainable Energy Reviews" follows in second place with 93 citations, emphasizes its significance in the renewable energy sector. Other notable sources include "Energies" with 48 citations, "Energy Procedia" with 30 citations, and "Applied Energy" with 27 citations.

Figure 3.
The Most cited document Sources

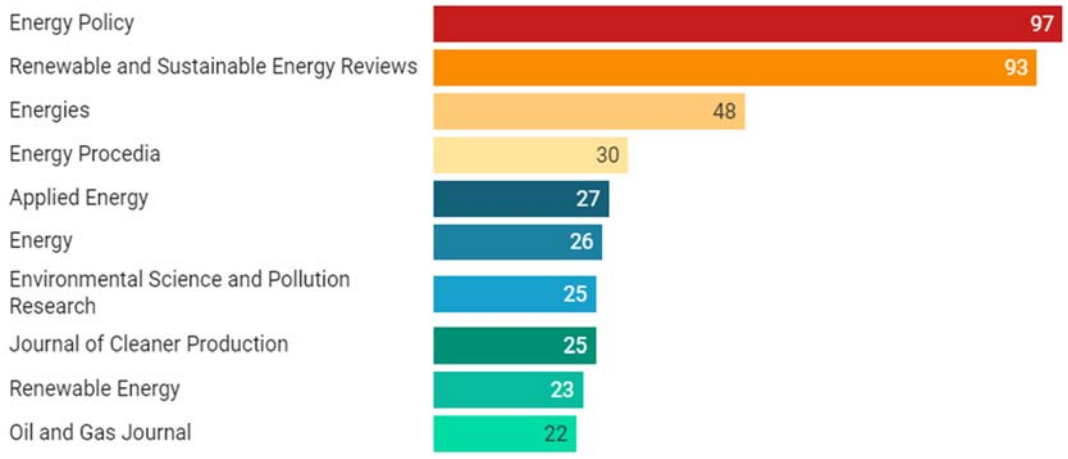


Figure 4 provides information on the top 15 countries with the highest numbers of co-authorship. The color representations in the legend of Figure 4 provide an understandable way to understand the document counts in a country, with darker colors indicating higher counts and lighter colors indicating lower counts. The color shades vary from deep purple to light yellow. The United States

stands out as the leading country with 229 co-authorships, showing its active involvement in collaborative research efforts specifically in research about renewable energy in oil & gas sector. The United Kingdom ranked third with 113 co-authorships. Other notable countries are Malaysia, India, Turkey including Indonesia with 36 co-authorships.

Figure 4.
The most Co-authorship Country

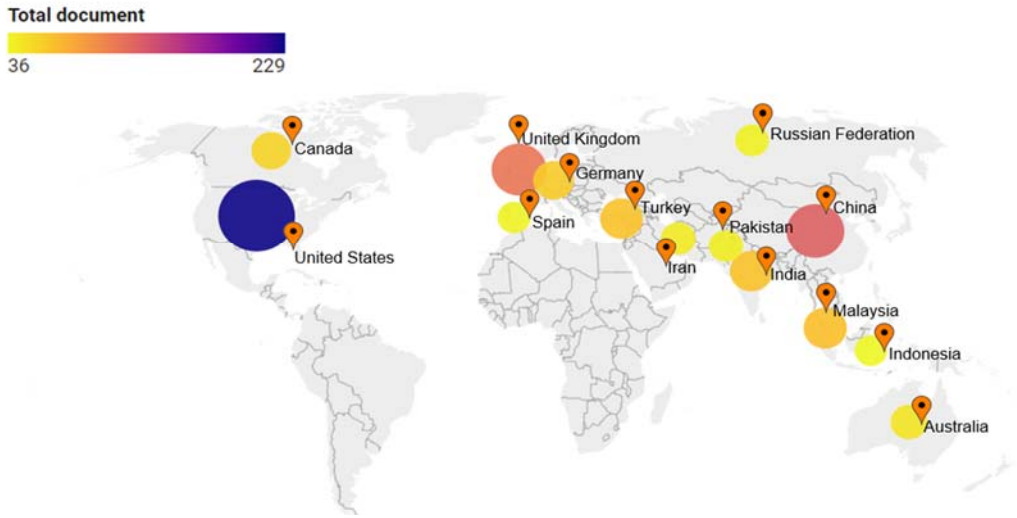


Table 1.
The most cited document countries

Country	Documents	Citations	Total Link Strength
United States	229	5744	65
Malaysia	68	5498	71
Turkey	66	5382	38
China	126	3243	64
United Kingdom	113	3013	63
Germany	60	1861	70
India	66	1820	14
Australia	47	1611	31
Italy	36	1536	8
Canada	56	1457	41
Spain	38	1443	18
Nigeria	33	1080	21
Indonesia	36	989	26
Austria	19	975	14
Portugal	17	901	7

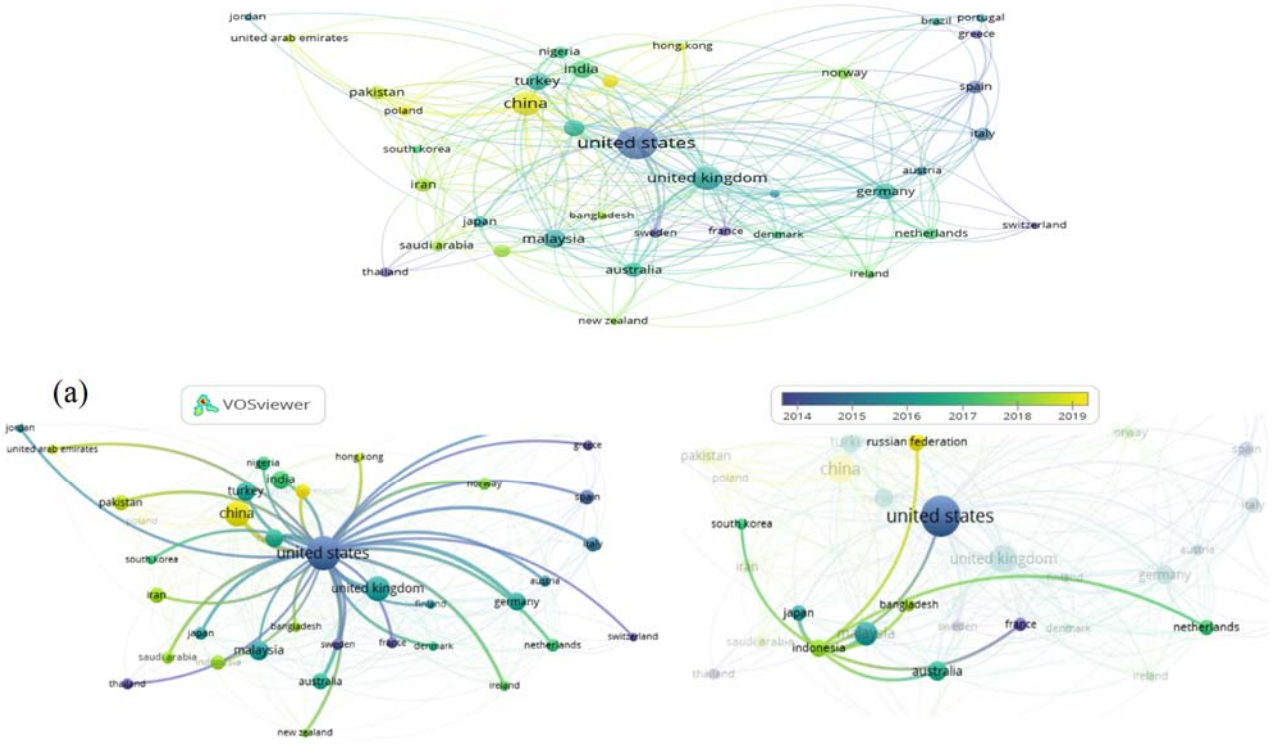
Table 1 provides the top 15 most cited countries based on the number of citations and total link strength. This data sheds light on countries that have contributed substantially to research in this field, by emphasizing the impact of citations and overall connectivity within the scientific communities. The United States still leads the list with 5,744 citations, closely followed by

Malaysia with 5,498 citations. Turkey, China, and the United Kingdom also ranked high in terms of citations. Among the most cited countries, Indonesia is listed as one of the most cited document countries with 36 documents and 989 citations. Even though Indonesia's citation count is relatively low compared to some of the other countries on the list, it still signifies Indonesia's contribution in the field of research.

Figure 5 showed the collaboration between countries in conducting research related to the topic. It can be inferred that the color schemes used to represent collaboration between countries denote different levels of collaboration. The blue to yellow color represents the year of collaboration. Still the thicker the line the more frequent the collaboration, not based on the color. This color representation provides a visual indicator to capture the different levels of collaboration between countries, as darker colors indicate stronger collaboration and lighter colors indicate lower levels of collaboration. Additionally, it can be seen that the United States collaborates a lot with authors from other countries (b). In the contrary, Indonesia only collaborates with a few countries, as shown in Figure 5(c).

Figure 5.

The author collaboration between countries (a), United States (b), and Indonesia (c)



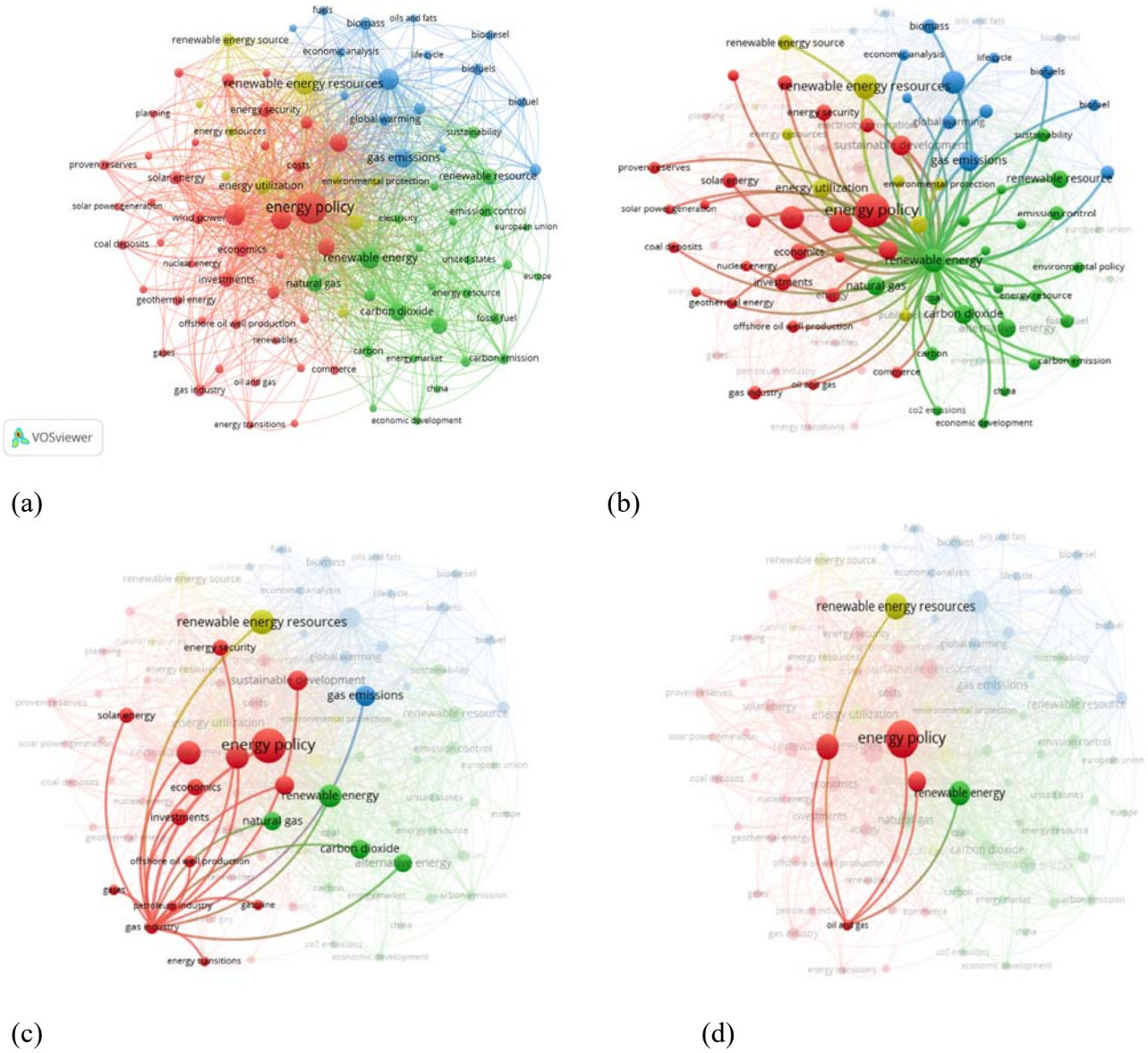
(b) (c)

In Figure 6, the data presented shows the occurrence and keywords that occur in the articles, Figure 6(a). "Energy policy" emerges as the most frequently mentioned keyword, its occurrence indicating its significant presence in the articles. "Renewable energy" follows close behind,

emphasizing the research's focus on renewable energy sources, Figure 6(b). The existence of the keyword "oil and gas" in the data highlights its connection to energy policy and renewable energy. Besides, the gas industry is closely linked to renewable energy and energy policy, Figure 6(c). Although "oil and gas" is a slightly different area within the energy domain, it is closely linked to the wider discussion of energy policy and the transition towards renewable energy sources, Figure 6(d). The frequent occurrence of keywords within the analyzed articles suggests a strong connection between renewable energy and the oil and gas industry.

Figure 6.

The Co-occurrence of all keywords (a), Renewable energy (b), Gas industry (c), and Oil and gas (d)



(a) (b)

(c) (d)

Table 2.
The Most Relevant Source on Oil & Gas Policy Regarding the Renewable Energy

Authors	Title	Source title	Cited
Lu, Guo, & Zhang (2019)	Oil and gas companies' low-carbon emission transition to integrated energy companies.	Science of the Total Environment	36
Noguchi, & Nobre (2023)	Oil and gas companies - Are they shifting to renewables? A study of policy mixes for energy transition in Brazil.	BAR - Brazilian Administration Review	0
Jarboui (2021)	Renewable energies and operational and environmental efficiencies of the US oil and gas companies: A True Fixed Effect model.	Energy Reports	10
Kashef, Attia, Kamh, & Abdel-Rahman (2022)	Techno-economic analysis of renewable energy application in oil and gas industry: A case study.	2022 23rd International Middle East Power Systems Conference, MEPCON 2022	0
Oshilalu, Ajiboye, & Oshilalu (2021)	Performance evaluation of major oil and gas companies diversifying into renewable energy resources.	AIAA Propulsion and Energy Forum, 2021	0
Hartmann, Inkpen, & Ramaswamy (2021)	Different shades of green: Global oil and gas companies and renewable energy.	Journal of International Business Studies	31
Chaiyapa, Esteban, & Kameyama (2018)	Why go green? Discourse analysis of motivations for Thailand's oil and gas companies to invest in renewable energy.	Energy Policy	36
Waziri, Hassan, & Kouhy (2018)	The effect of transitioning to renewable energy consumption on the Nigerian oil and gas exports: An ARDL approach.	International Journal of Energy Sector Management	9
Romasheva, & Cherepovitsyna (2023)	Renewable energy sources in decarbonization: the case of foreign and Russian oil and gas companies.	Sustainability (Switzerland)	0
Haider (2020)	Estimates of total oil & gas reserves in the world, future of oil and gas companies, and smart investments by E & P companies in renewable energy sources for future energy needs.	International Petroleum Technology Conference 2020, IPTC 2020	17

Table 2 lists the top 10 most relevant publications discussing about how renewable energy and oil and gas policies engage. The movement of oil and gas companies towards integrated energy models, the policy mix for the energy transition in particular regions, and techno-economic evaluations of renewable energy applications in the oil and gas industry were just a few of the various problems that address. It also looks at what drives oil and gas companies to invest in renewable energy, how transitioning to renewable energy consumption might impact oil and gas exports, and how different oil and gas corporations are tackling the issue of climate change.

Discussion

Renewable energy implementation in the oil and gas sector

Oil and gas companies have faced considerable criticism from the international community for their prominent contribution to the emission of anthropogenic greenhouse gases, primarily through the burning of hydrocarbon fuels. Along with increasingly strict environmental requirements and regulations, these companies are forced to undertake initiatives aimed at decarbonizing and reducing their carbon footprint. One approach adopted by oil and gas companies is to incorporate renewable energy sources into their operations. One of the primary challenges in recent times is getting the energy sector to increase its use of renewable energy and determining the role that oil and gas companies to help or hinder this process. According to a study conducted by (Jarboui, 2021), the production and integration of renewable energy in oil and gas companies has shown a significant impact on operational efficiency and the environment. This study highlights that the implementation of renewable energy initiatives not only contributes to reducing operational costs and increasing efficiency in these companies, but also plays an important role in promoting environmental sustainability. It further emphasizes that environmental regulations and the transition towards cleaner energy sources have a direct impact on the efficiency and performance of high-carbon industries such as oil and gas. (Romasheva & Cherepovitsyna, 2023) also asserted that the integration of RES into the production activities of oil and gas companies plays a crucial role in promoting decarbonization efforts and addressing the environmental challenges associated with the industry.

(Waziri et al., 2018) stated that the transition to renewable energy is currently happening and will continue in the future. It is also clearly stated that the attempts of transition to renewable energy made by developed countries, non-governmental organizations, and influential entities to achieve sustainable development are yielding positive results. However, from the perspective of Nigerian oil & Gas companies, it was found that there will be economic challenges, that the ongoing shift towards renewable energy makes oil and gas resources outdated and irrelevant as a source of energy. Nonetheless, (Noguchi & Nobre, 2023) stated that the potential success of the energy transition to renewable energy by oil and gas (O&G) companies relies significantly on the implementation of supporting public policies. Although oil and gas companies have the potential and resources to play an important role in driving the transition to renewable energy, public policies must be aligned with and encourage this shift. The public policy serves as an important catalyst, providing clear direction, incentives and regulatory frameworks that create favorable conditions for O&G companies to adopt renewable energy practices. (Noguchi & Nobre, 2023) suggested proposes that public policy should include several key components. Firstly, it should have a regulatory framework for all renewable energy sources, which enables the development of new projects and provides investment certainty and a competitive energy market. In addition, a regulatory authority specifically focused on renewable energy should be established.

The transformation of oil and gas companies takes time and is not always easy for oil and gas companies to transition to using renewable energy. Although maintaining a collaborative and cooperative approach between these companies is essential, it is also critical to have strong policy supporting from governmental, local, or organizational bodies (Lu et al., 2019). The findings of

(Hartmann et al., 2021) study emphasize that oil and gas companies investments in renewable energy are heavily influenced by institutional factors at the national level, such as laws and standards. These decisions are also influenced by environmental citizenship and internationalization factors. An in-depth understanding of the energy transition in the oil and gas industry may be attained by taking into account both the external institutional environment and the internal company motivations and capabilities. In addition, businesses themselves understand the value of diversity in lowering the risks brought on by unstable oil prices. In this situation, governments can play a significant role in motivating and assisting businesses in making the transition to the development of low-carbon energy sources. Governments may assist and speed up the implementation of renewable energy solutions by businesses by providing the proper incentives, laws, and support, thus contributing to national energy goals and environmental sustainability (Chaiyapa et al., 2018).

Management policies to support renewable energy implementation in oil and gas

The widespread implementation of renewable energy in the oil and gas industry is significantly supported by management policies. The management policy for renewable energy in oil and gas companies outlines strategic steps and best practices for promoting and integrating the use of renewable energy sources into everyday activities. The goal of this policy is to create a regulatory framework that encourages the use of renewable energy technology, promotes a competitive energy market, and offers investors security when investing in renewable energy projects. It also involves the creation of governing organizations that supervise the application of and commitment to renewable energy initiatives. Furthermore, the management policies put a lot of attention on developing the strategies and tools that will direct the transition to renewable energy, including establishing the infrastructure required for renewable energy generation and distribution.

Management policies towards implementing renewable energy in the oil and gas sector should concentrate on certain vital components, based to the relevant articles in this research. The first is that oil and gas companies should put a lot of attention to incorporating renewable energy sources into their operations. Investing in renewable energy initiatives and technologies, such as solar or wind power, and integrating them into the current infrastructure would be required. Second, public policies should be developed to aid with and promote the transition to renewable energy sources. The regulations should cover all renewable energy sources, establish a regulatory body that simply deals with renewable energy, and offer financial incentives and support for renewable energy projects. Moreover, collaboration and cooperation between oil and gas companies, as well as support from national, local entities and organizations, are crucial for the successful implementation of renewable energy practices. Furthermore, it is important to consider institutional factors at the country level, such as regulations and norms, as well as factors related to environmental citizenship and internationalization, as these significantly influence oil and gas companies' decisions and actions towards renewable energy. Through aligning management policies with the findings and implementing supportive measures, the oil and gas industry can effectively contribute to the energy transition, reduce carbon emissions, and promote sustainable development.

In this study, we suggest that the implementation of change management strategies in the oil and gas industry to embrace renewable energy requires a clear vision, commitment from top-level

management, and specific goals for renewable energy adoption. A comprehensive assessment must identify risks and opportunities, while adequate resources must be allocated for funding, partnerships, and technology acquisition. Besides, employee engagement and training are essential, along with collaboration with stakeholders and alignment with supportive policies. Frequent monitoring and evaluation will also ensure project performance and sustainability. The successful management of change in the oil and gas sector requires strong leadership, strategic planning, resource allocation, employee engagement, stakeholder involvement, and ongoing evaluation for a successful transition to renewable energy.

Limitation of the study

As with other studies, this research also has limitations. One of the limitations is the exclusive use of data from Scopus, which may cause the scope of the study to become narrower. By solely relying on Scopus, there is a possibility of excluding relevant research and publications indexed in other databases, such as Web of Science (WoS) or other relevant indexing databases. In order to overcome this constraint to gain a more thorough grasp of this problem, future research may take into account integrating data from other databases.

Conclusion

The study offers important insights into supporting strategies for the implementation of renewable energy in the oil and gas industry. The key trends, patterns, and relationships that arise from the analysis of the bibliometric data point to a vital relationship between the oil and gas industry and renewable energy. According to the growth in the number of annual publications, a significant increase in research for the use of renewable energy in the oil and gas industry is highest in 2021. On the basis of relevant studies, it is highlighted firmly how crucial it is for oil and gas companies to include renewable energy sources into their business processes. It became clear that management policy were crucial and the implementation of renewable energy initiatives contributed to operational effectiveness, cost reduction, and environmental sustainability. Further findings revealed the critical role management policies play in successfully integrating renewable energy. The integration of renewable energy, the establishment of regulatory frameworks, the provision of incentives and subsidies, the promotion of cooperation, and the adherence to institutional considerations should be the main objectives of these policies. A successful transition to renewable energy depends on a change management plan that incorporates a clear vision, leadership commitment, goal setting, resource allocation, employee engagement, stakeholder involvement, and continuing evaluation.

Declaration of conflicting interests

The authors declare that there is no conflict of interest regarding the publication of this article. This article has never been published before and was published with the approval of all parties. In addition, this research did not receive financial support from any party and there was no element of interest in any particular party.

References

Abu-Rumman, G., Khdair, A. I., & Khdair, S. I. (2020). Current status and future investment potential in renewable energy in Jordan: An overview. *Heliyon*, *6*(2), e03346. https://doi.org/10.1016/j.heliyon.2020.e03346

AL-Shubiri, F. N. (2015). The impact of economic and financial variables on cash conversion cycle of energy, oil and gas sectors listed in muscat security market. *International Journal of Energy Economics and Policy*, *5*(1), 174-181.

Chaiyapa, W., Esteban, M., & Kameyama, Y. (2018). Why go green? Discourse analysis of motivations for Thailand's oil and gas companies to invest in renewable energy. *Energy Policy*, *120*, 448-459. https://doi.org/10.1016/j.enpol.2018.05.064

Guercini, S., & Tunisini, A. (2017). Regional Development Policies. *No Business Is an Island: Making Sense of the Interactive Business World*, 141-156. https://doi.org/10.1108/978-1-78714-549-820171008

Haider, W. (2020). Estimates of total oil & gas reserves in the world, future of oil and gas companies and smart investments by e & p companies in renewable energy sources for future energy needs. *In International Petroleum Technology Conference*. https://doi.org/10.2523/iptc-19729-ms

Hartmann, J., Inkpen, A. C., & Ramaswamy, K. (2021). Different shades of green: Global oil and gas companies and renewable energy. *Journal of International Business Studies*, *52*(5), 879-903. https://doi.org/10.1057/s41267-020-00326-w

Jarboui, S. (2021). Renewable energies and operational and environmental efficiencies of the US oil and gas companies: A True Fixed Effect model. *Energy Reports*, *7*, 8667-8676. https://doi.org/10.1016/j.egyr.2021.04.032

Johnston, R. J., Blakemore, R., & Randolph, B. (2020). The Role of Oil and Gas Companies in the Energy Transition. In *Atlantic Council (2020)*. www.AtlanticCouncil.org

Kashef, M., Attia, M. A., Kamh, M. Z., & Abdel-Rahman, M. (2022, December). Techno-Economic Analysis of Renewable Energy Application in Oil and Gas Industry: A Case Study. In *2022 23rd International Middle East Power Systems Conference (MEPCON)* (pp. 1-6). IEEE. https://doi.org/10.1109/MEPCON55441.2022.10021779.

Kuzior, A., & Sira, M. (2022). A Bibliometric Analysis of Blockchain Technology Research Using VOSviewer. *Sustainability (Switzerland)*, *14*(13). https://doi.org/10.3390/su14138206

Laskar, S. (2022). An Integrated Management of Change Program (MOC) for Oil and Gas Industry through Blockchain Technology and Smart Contracts. In *ADIPEC* (p. D011S002R002). https://doi.org/10.2118/210790-MS

Lu, H., Guo, L., & Zhang, Y. (2019). Oil and gas companies' low-carbon emission transition to integrated energy companies. *Science of the Total Environment*, *686*, 1202-1209. https://doi.org/10.1016/j.scitotenv.2019.06.014

Mewenemesse, H. T., & Yan, Q. (2022). Review and Assessment of Energy Policy in the Economic Community of West African States Region. *International Journal of Energy Economics and Policy*, *12*(5), 232-242. https://doi.org/10.32479/ijeep.13413

Noguchi, A., & Nobre, F. S. (2023). Oil and Gas Companies — Are They Shifting to Renewables? A Study of Policy Mixes for Energy Transition in Brazil. *BAR - Brazilian Administration Review*, *20*(1). https://doi.org/10.1590/1807-7692bar2023220087

Oshilalu, A. Z., Ajiboye, A. R., & Oshilalu, F. O. (2021). Performance Evaluation of Major Oil and Gas Companies Diversifying into Renewable Energy Resources. In *AIAA Propulsion and Energy 2021 Forum* (p. 3370). https://doi.org/10.2514/6.2021-3370

Rezaei, G., Esmaeilvalizadeh, & Kashani, N. (2021). How to reduce financial costs using renewable energies in developing countries. *Journal of Contemporary Issues in Business and Government*, *27*(06), 115-128. https://doi.org/10.47750/cibg.2021.27.06.009

Romasheva, N., & Cherepovitsyna, A. (2023). Renewable Energy Sources in Decarbonization: The Case of Foreign and Russian Oil and Gas Companies. *Sustainability (Switzerland)*, *15*(9). https://doi.org/10.3390/su15097416

Seetharaman, Moorthy, K., Patwa, N., Saravanan, & Gupta, Y. (2019). Breaking barriers in deployment of renewable energy. *Heliyon*, *5*(1), e01166. https://doi.org/10.1016/j.heliyon.2019.e01166

Suzan, V., & Suzan, A. A. (2021). A bibliometric analysis of sarcopenia: top 100 articles. *European Geriatric Medicine*, *12*(1), 185-191. https://doi.org/10.1007/s41999-020-00395-y

Tamala, J. K., Maramag, E. I., Simeon, K. A., & Ignacio, J. J. (2022). A bibliometric analysis of sustainable oil and gas production research using VOSviewer. *Cleaner Engineering and Technology*, *7*, 100437. https://doi.org/10.1016/j.clet.2022.100437

Vakulchuk, R., Overland, I., & Scholten, D. (2020). Renewable energy and geopolitics: A review. *Renewable and Sustainable Energy Reviews*, *122*(January), 109547. https://doi.org/10.1016/j.rser.2019.109547

Waziri, B. Z., Hassan, A., & Kouhy, R. (2018). The effect of transitioning to renewable energy consumption on the Nigerian oil and gas exports: An ARDL approach. *International Journal of Energy Sector Management*, *12*(4), 507-524. https://doi.org/10.1108/IJESM-11-2017-0010

Yuniza, M. E., Rebecca, A. G., & Ramadhaniati, R. C. (2020). A necessity or a premature move? The shift of Indonesian production sharing contract in the oil and gas industry. *International Journal of Energy Economics and Policy*, *10*(4), 251-257. https://doi.org/10.32479/ijeep.9024